REMARKS

This document is filed in reply to the Office Action dated August 9, 2010 ("Office Action"). Applicants have amended claims 1, 2, 4, 9, and 10 to more particularly point out and distinctly claim their invention. Support for "downregulating [the ability of LuxR or a homologue of LuxR to activate transcription]" added to claim 1 can be found in the application published as US 20070264715 (the "Specification") at, e.g., paragraph [0011]. Support for the word "compound" appears in the Specification at, e.g., paragraph [0037]. Support for "capable of irreversibly hydrolysing amide bonds in peptides and proteins" can be found at, e.g., paragraph [0027]. At the Examiner's suggestion, Applicants have also amended the Specification to correct informality. No new matter has been introduced.

Upon entry of the proposed amendments, claims 1, 2, and 4-20 are pending. Among them, claims 13-20 have been withdrawn from further consideration. Claims 1, 2, and 4-12 are under examination. Applicants respectfully request that the Examiner reconsider this application in view of the above amendments and the following remarks.

Objection to Claim 4

Claim 4 was objected to or rejected under 35 U.S.C. §112. In view of the above amendments, Applicants submit that the objection or rejection is overcome.

Objection to Specification

The Examiner objected to the Specification for minor informalities. Applicants have amended the Specification and corrected the informalities. Withdrawal of the objection is respectfully requested.

Objection to Claim 1

The Examiner objected to claim 1 for informalities. In view of the above amendment to claim 1, Applicants submit that the objection is overcome and respectfully request withdrawal of the objection.

Rejection under 35 U.S.C. § 102(b)

The Examiner rejected claims 1-9 and 11-12 for being anticipated by one or both of two references. Applicants will discuss each of the references below.

I

The Examiner rejected claims 1, 4-7, 9, and 11-12 for being anticipated by Salton, *J. gen. Microbiol.* 9, 512-523 ("Salton"). See the Office Action, pages 6-7, carryover paragraph. The claims are drawn to a method of regulating quorum sensing in bacteria; the method requires a step of downregulating the ability of LuxR or a homologue of LuxR to activate transcription, where quorum sensing is downregulated by treating the bacteria with a peptide hydrolase or compound capable of irreversibly hydrolysing amide bonds in peptides and proteins. The Examiner acknowledged that Salton makes no reference to LuxR or quorum sensing in bacteria, but suggested that the reference inherently anticipates the claimed invention. Applicants respectfully traverse.

First, the Examiner cited *Atlas Powder Co. v IRECA* as providing basis for the assertion that "the discovery of a previously unappreciated property of a prior art composition, or of a scientific explanation for the prior arts functioning, does not render the old composition patentably new to the discoverer. The Court further held that this same reasoning held true when it is not a property but an ingredient which is inherently contained in the prior art (emphases added)." Applicants respectfully note that this citation is irrelevant to the present case. More specifically, the *Atlas Powder Co.* decision relates specifically to the patentability of compositions. In contrast, the claims at issue are drawn to a method. Thus, it is submitted that the Examiner's reliance on the *Atlas Powder Co.* decision is misplaced.

Second, Applicants would like to point out that the Examiner's characterization of Salton is fundamentally flawed. The Examiner asserted that Salton teaches that treatment of bacteria with trypsin "resulted in irreversible peptide and protein bond hydrolysis resulting in cell death". However, Applicants note that, in fact, what Salton teaches is that trypsin had no effect on "untreated" gram-negative and gram-positive bacteria. Only if the bacteria were pre-heated and autoclaved to kill the bacteria was trypsin shown to have an effect in lysis of the cell walls of the dead bacteria. In this connection, Applicants would like to bring the following passages of Salton to the Examiner's attention:

> "Untreated cells of three Gram-negative and four Gram-positive bacteria were resistant to lysis by crude and crystalline trypsin. The resistance of the Gram-negative organisms to lysis by trypsin was abolished by heating suspensions for 5 min. at 100°; the rates and extent of lysis of the three organisms by crude trypsin were comparable." Page 512, first sentence, emphases added;

> "Untreated suspensions of *Bact. coli, Ps. Fluorescens and Sp. Serpens* in phosphate buffer were incubated for 2 hr. at 37° with: (1) crude trypsin, 1 mg./ml., pH 7-6; (2) crystalline trypsin, *100 µg./ml.*, pH 7-6; (3) crystalline ribonuclease, 50 *µg./ml.* pH 7-6; (4) crystalline lysozyme concentration of 100µg. and 1 mg./ml., pH 6-2. Turbidity readings of control and enzymetreated suspensions taken at intervals over the incubation period showed no significant differences." Page 514, final paragraph, emphases added;

> "Lysis experiments with Gram-positive bacteria.
> *Micrococcus Iysodeikticus.* Turbidity measurements performed on suspensions of unheated cells of M. *Iysodeikticus* in phosphate buffer (pH 7-6) containing either crude trypsin (1 mg./ml.), crystalline trypsin *(100 µg./ml.)* or crystalline ribonuclease (50 µg./ml) showed no differences from control suspensions in buffer alone, when incubated for 2 hr. at 37°." Page 516, second paragraph, emphases added.

Clearly, Salton in no way discloses, either explicitly or inherently, the effect of peptide hydrolases down-regulating LuxR or homologs of LuxR in bacteria. To the contrary, Salton teaches that trypsin has no effect on live, un-heat-treated bacteria. It is therefore submitted that Salton does not render the claims at issue unpatentable. Withdrawal of the rejection is therefore requested.

II

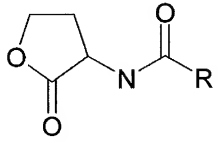
The Examiner rejected claims 1, 2, 5-7, 9, and 11-12 for being anticipated by WO 2003068951 by Zhang *et al.* ("Zhang"). See the Office Action, page 7, item 14. Applicants disagree and would like to point that the Examiner has again mischaracterized the cited reference.

Zhang relates to a gene, *qsbA,* which encodes a protein useful for inactivating certain bacterial quorum sensing signal molecules (N-acyl homoserine lactones) (see the Abstract and paragraph [00022]). In other words, the protein targets the N-acyl homoserine lactone signal molecule and not LuxR (or homologue of LuxR), as recited in the claims at issue.

Moreover, the activity of the protein described in Zhang is different from the peptide hydrolases as recited in the claims. In particular, Zhang states at that:-

> *"The primary structure* of *the protein,* as *well* as *enzyme activity analysis with different substrates, discussed below, therefore indicates that qsbA encodes an AHL-acylase which cleaves the amide linkage between the acyl side chain and the homoserine lactone moiety* of *AHLs."*

See paragraph [00027], final sentence. AHLs have the following structure in which R is variable but comprises various alkyl side chains. However, the R groups of AHLs are not amino acids or peptides. Accordingly, the extra-cyclic amide bond cleaved by the AHL-acylase disclosed in Zhang is not "an amide bond in a peptide or protein as required by the present invention."



In view of the above remarks, Applicants respectfully submit that Zhang does not teach or suggest the method of the claims. Thus, withdrawal of the rejection is respectfully requested.

Rejection under 35 U.S.C. § 103(a)

The Examiner rejected claims 8-10 and 12 for obviousness over Zhang as applied to claims 1-3, 5-7, 9, and 11-12 above in view of US20030027310 by Berka ("Berka"). See the Office Action, page 8, item 16. Applicants respectfully traverse.

Claims 8-10 and 12 depend from claim 1 or 9, directly or indirectly. As set forth above, Zhang, the primary reference, does not teach or suggest the method of claim 1 or 9. According to the Examiner, Berka merely teaches detergent/biocide, spray, non-aqueous carriers, and catheters. Clearly, Berka does not rectify the defects of Zhang. Thus, claims 1 and 9 are patentable over Zhang and Berka. Claims 8-10 and 12 depend from claim 1 or 9. For at least the same reasons, they are also patentable.

CONCLUSION

In view of the foregoing, Applicants believe all the issues raised by the Examiner have been fully addressed and all the pending claims in this application are in condition for allowance, and an early notice to this effect is earnestly solicited.

To the extent that any extra fees are required, in connection with receipt, acceptance and/or consideration of this paper and/or any accompanying papers submitted herewith, please charge all such fees to Deposit Account 50-1943.

Should the Examiner have any questions or comments with respect to this response, it is respectfully requested that the Examiner telephone the Applicants' undersigned attorney at (609) 844-3020 to discuss any additional matters.

Respectfully submitted,

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